Perimeter Air Monitoring Plan

Former ORP/Building 1 Area

Former Oakland Army Base—EDC Area

Oakland, California

Prepared For:

Oakland Base Reuse Authority
700 Murmansk Street, Suite 3
Oakland, California 94607

September 16, 2005

Prepared By:

Northgate Environmental Management, Inc.
300 Frank H. Ogawa Plaza, Suite 510
Oakland, California 94612

1147.01

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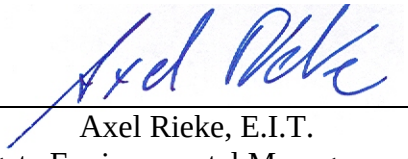

Axel Rieke, E.I.T.
Northgate Environmental Management, Inc.
Project Engineer

Ted Splitter, P.E., G.E.
Northgate Environmental Management, Inc.
Principal

1147.01

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ABBREVIATIONS AND ACRONYMS

ASTM	American Society for Testing and Materials
CIH	Certified Industrial Hygienist
EBMUD	East Bay Municipal Utility District
EDC	Economic Development Conveyance
EIR	Environmental Impact Report
EKI	Erler and Kalinowski, Inc.
µg/m^3	Micrograms per cubic meter
µg/mL	Micrograms per milliliter
mL	Milliliter
mg	Milligram
mm	Millimeter
MPH	Miles per hour
NIOSH	National Institute for Occupational Safety and Health
NWS	National Weather Service
OBRA	Oakland Base Reuse Authority
ORP	Oil Reclaiming Plant
PAMP	Perimeter Air Monitoring Plan
PM10	Particulate Matter less than 10 Micrometers
POTW	Publicly Owned Treatment Works
RAL	Recommended Action Level
RAP	Remedial Action Plan
RDIP	Remedial Design and Implementation Plan
RMP	Risk Management Plan
SSO	Site Safety Officer

1.0 INTRODUCTION

This Perimeter Air Monitoring Plan (PAMP) has been prepared by Northgate Environmental Management, Inc. (Northgate) on behalf of the Oakland Base Reuse Authority (OBRA) for the remediation of the former Oil Reclaiming Plant (ORP)/Building 1 Area of the former Oakland Army Base—Economic Development Conveyance (EDC) Area (Site). The PAMP will be implemented to monitor airborne dust, airborne lead, and hydrogen sulfide, at the perimeter of the Site during demolition, excavation, stockpiling, and soil treatment and loading, activities.

This PAMP has been prepared to comply with the requirements for perimeter monitoring of suspended particulate matter and gas emissions set forth in the following documents:

- Mitigation Measure 4.4–1 of the *Final Environmental Impact Report for the Oakland Army Base Redevelopment Plan* (Final EIR) (City of Oakland, 2002);
- *Final Remedial Action Plan* (RAP) (Erler and Kalinowski, Inc. [EKI], 2002a);
- *Final Risk Management Plan* (RMP) (EKI, 2002b);
- *Draft Remedial Design & Implementation Plan for the Former ORP/Building 1 Area, Former Oakland Army Base—EDC Area* (Draft RDIP) (EKI, 2004); and
- *Contract Documents for Former ORP/Building 1 Area Remediation Project* (Contract Documents) (EKI, 2005).

2.0 WIND SPEED AND DIRECTION MONITORING

Local wind speed and direction have been monitored continuously at the meteorological weather station in the vicinity of the Port of Oakland during 2002 to 2003. Based on these data, local wind patterns were found to be relatively consistent. With the prevailing winds from the north-westerly, southwesterly, and westerly directions (GAIA Consulting, Inc., 2003) and mean wind speeds ranging from 1 to 7 miles per hour (MPH).

During the remediation of the Site, local meteorological real-time data, including wind direction and speed, will be obtained from a weather station at the nearby Oakland International Airport. Data from this station is made available by the National Weather Service (NWS).

In addition to documenting the NWS data, field personnel will, on a daily basis, monitor wind speed with a hand-held instrument (e.g., Kestrel™ wind meter). Monitoring will occur at the beginning, middle, and end of each potential dust-generating workday. A potential dust-generating workday is characterized by the use of heavy equipment to excavate, stockpile, load or treat soil.

The Site Safety Officer (SSO) will monitor and record the average daily wind speed, the direction data from NWS, and the onsite wind speed on a field log form. Wind direction will be reported as points of compass (e.g., wind blowing from north, northeast to south, southwest is referred as a “north northeast wind” or NNE wind). The logged wind data will be used to interpret the localized particulate data collected at the perimeter of the former ORP/Building 1 Area.

3.0 PERIMETER AIR MONITORING LOCATIONS

To protect human health and safety of the surrounding community, air monitoring will be conducted at a minimum of four locations, as shown on Figure 2, along the perimeter of the Site including:

- the intersection of Bataan Avenue and Attu Street
- the intersection of Bataan Avenue , Corregidor Avenue and Africa Street;
- 80 feet northeast of the intersection of Africa Street and Alaska Street; and
- 120 feet northwest of the intersection of Alaska Street and Australia Street.

These locations have been selected based on the locations where heavy equipment will be operated and the goal of having an upwind and downwind location. Pacific States Environmental Contractors, Inc. (Pacific States) may modify these locations, with authorization from the OBRA's Representative, based on meteorological conditions and type and location of work being conducted. The station locations will be modified, if necessary, so that monitoring can be performed in approximate upwind, downwind, and crosswind directions based on daily changes in the actual wind directions. The instrument's sampling inlet will be placed at a height of approximately 7 feet above ground level.

4.0 AIR SAMPLE COLLECTION PROCEDURES

Table 1 provides information on the anticipated monitoring equipment, purpose, equipment calibration, filter media (if applicable) sampler flow rate, duration of sampling events, analytical method, and reporting limits. Ambient air will be monitored with these instruments for levels of airborne dust, airborne lead, and hydrogen sulfide, following the procedures as described below. Table 2 shows the monitoring schedule, frequency and duration for all remediation activities (e.g. excavation, soil treatment, stockpiling and loading)

4.1 Airborne Dust

Pacific States will continuously monitor airborne dust at the Site perimeter monitoring locations during all potential dust-generating activities (i.e., excavation, stockpiling, loading, and soil treatment), including the operation of heavy equipment, using direct-reading instruments (e.g., Mini-Ram pDR 1000™) for measurement of total suspended particulate matter. Electronic data logs of real-time measurements will be used to determine the maximum and average dust concentrations at the upwind and downwind perimeter monitoring locations.

If results from any day show that the maximum downwind concentration (minus upwind background concentration) exceeds 1,000 micrograms per cubic meter ($\mu g/m^3$), corrective actions will be taken as described in Section 7.0.

4.2 Airborne Lead

During the first week of excavation and the first week of soil treatment (i.e., 5 workdays per week), Pacific States will conduct daily air sampling during each work shift (between 7:00 AM and 5:00 PM) for lead analysis at each perimeter sampling station using a high-volume air sampling pump (e.g., AirLite™ sampling pump or equivalent) and dust collecting membrane filter. Samples will be collected using a 37-millimeter (mm) diameter pre-weighted filter. Samples will be analyzed using gravimetric analysis; all results will be reported in concentrations of $\mu g/m^3$.

Sample filters will be recovered each day that monitoring is performed and will be placed in appropriate labeled containers indicating the date, sample location, sample collection time (total plus on/off times), and total air volumetric flow through the sampler. The filters will be sent off-site in separate containers accompanied by a chain-of-custody form and transmittal letter to EMS Laboratories, Inc., of Pasadena, California, for measurement of airborne lead content by National Institute for Occupational Safety and Health (NIOSH) Method 7082.

Results will be presented as a 24-hour average concentration of lead in time-integrated ambient air samples as total suspended particulate matter less than 10-micrometers in size (PM10).

If results from any day show that the average downwind concentration (minus upwind background concentration) exceeds 1.9 µg/m^3, corrective actions will be taken as described in Section 7.0. The background concentration is estimated to be approximately 0.03 µg/m^3 (EKI, 2004).

In consultation with and approval by OBRA, the frequency of perimeter air sample collection for lead analysis may be reduced after the first week (e.g., to once per week during active soil excavation or handling).

4.3 Hydrogen Sulfide

Pacific States will monitor hydrogen sulfide levels at one upwind and two downwind locations of the work area using a real-time instrument (e.g., Gerome 631™) approximately once per hour during any activity that generates hydrogen sulfide odors (e.g., excavating, stockpiling, loading, mixing, and/or treating organic residue). Measurements will be manually documented on a field log form.

In addition, Pacific States will continuously monitor hydrogen sulfide in ambient air, over 15-minute averaging periods using a real-time instrument (e.g., Gerome 631™) located at a location downwind at the perimeter fence during those times when activities are expected to generate hydrogen sulfide odors. Measurements will be internally logged and downloaded by field personnel to a personal computer. If measurements at any time show that the maximum concentration exceeds 84 µg/m^3) corrective actions will be taken as described in Section 7.0. If air monitoring results show that the average concentration for a period of greater than 15-minutes exceeds 42 µg/m^3, corrective actions will be take as described in Section 7.0.

More frequent monitoring will be performed if significant odors are observed by Pacific States, the OBRA Representative, or other on-site personnel. It should be noted that the East Bay Municipal Utility District's (EBMUD) Publicly Owned Treatment Works (POTW) is located directly across Maritime Street from the project Site on Wake Avenue (typically downwind from the Site). The POTW releases significant levels of odorous emissions, which can be detected on the subject Site. In order to verify that hydrogen sulfide measurements on the subject Site are not being biased by this off-site source, initial monitoring will take place under differing wind conditions to measure hydrogen sulfide prior to on-site construction operations.

4.4 Additional Air Contaminants

Air monitoring activities for other chemicals of potential concern (e.g., sulfur dioxide) may be performed, if determined to be appropriate based on conditions encountered in the judgment of Pacific State's Certified Industrial Hygienist (C.I.H.) or the OBRA Representative.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The SSO is responsible for checking the proper location, function, and use of all air monitoring instruments. The SSO will prepare a daily field report including air monitoring records of wind observation and air monitoring events. The SSO is responsible for the collection of data in accordance with this PAMP, field documentation, and logging of data onto a personal computer for electronic transmittal.

Field personnel will check perimeter monitors on a half-day basis to verify they are operational. Instruments will be maintained and calibrated in accordance with applicable manufacturer guidelines or vendor directives.

Logged field observation of wind speed will be compared to local measurements made by the NWS to evaluate meteorological data used to interpret airborne dust and airborne lead monitoring results.

A NIOSH Method 500 high-volume air filter analysis will be scheduled once a week to evaluate real-time dust monitoring results. One filter per week per instrument will be sent for measurement of total collected mass (gravimetrical analysis) by NIOSH Method 500, to determine average dust concentrations at the upwind and downwind boundary monitoring locations. The NIOSH Method 500 time-integrated measured results will then be used for comparison to the calculated time-integrated results of the real-time dust monitoring.

One field blank will be sent per set of filters to ensure that contamination of samples is not occurring in the field. Blank filter analysis will control quality of data derived from NIOSH Methods 7082 and 500.

The analytical laboratory will perform high-precision gravimetric analysis of the 37-mm sample membrane filters. The filters will be sent in separate containers accompanied by a chain-of-custody form and transmittal letter specifying the operation flow rate and timeframe of each filter. These filters will be re-weighed by the laboratory with an accuracy of approximately 0.05 milligram (mg) using NIOSH Method 500 clean dust-free handling procedures.

EMS Laboratories, Inc. will perform all dust analyses in accordance with the following NIOSH Method 500 procedures regarding calibration and quality control:

- Zero the microbalance before all weightings.
- Use the same microbalance for weighing filters before and after sample collection.

- Maintain and calibrate the balance with National Institute of Standards and Technology Class S-1.1 or American Society for Testing and Materials (ASTM) Class 1 weights.
- The set of replicate samples should be exposed to the same dust environment, either in a laboratory dust chamber or in the field.
- The quality control samples must be taken with the same equipment, procedures, and personnel used in the routine field samples.
- The relative standard deviation calculated from these replicates should be recorded on control charts and action taken when the precision is out of control.

EMS Laboratories, Inc. will perform all lead analyses in accordance with the following NIOSH Method 7082 procedures regarding calibration and quality control:

- Prepare a series of working standards covering the range 0.25 to 20 micrograms per milliliter (µg/mL) lead;
- Add aliquots of calibration stock solution to 100-milliliter (mL) volumetric flasks.
- Dilute to volume with a 10 percent solution of nitric acid (10% HNO_3);
- Store the working standards in polyethylene bottles and prepare fresh weekly;
- Analyze the working standards together with the blanks and samples;
- Prepare a calibration graph of absorbance vs. solution concentration (µg/mL);
- Aspirate a standard for every 10 samples to check for instrument drift; and
- Check recoveries with at least one spiked media blank per 10 samples; use method of standard additions occasionally to check for interferences.

6.0 DOCUMENTATION AND DATA TRANSMISSION

Calibration records will be maintained by the SSO in the Site files, and by the Site Supervisor at his or her office, in accordance with the *Site-Specific Health and Safety Plan* (Northgate, 2005a). A complete set of measured data and analytical results will be made available to the OBRA Representative after completion of remediation activities in the form of a perimeter air monitoring report. Electronic data logs will be made readily available to the OBRA Representative as described below.

6.1 Airborne Dust

Real-time air monitoring results will be made available daily to the OBRA Representative during the progress of the remedial activities to evaluate dust control measures. Electronic data will be downloaded and archived from each instrument onto a personal computer. Unformatted data logs will then be available in the field to the OBRA Representative. A complete set of formatted data will made available by Pacific States at the beginning of the following week after the sampling event via electronic transmittal.

6.2 Airborne Lead

Upon request, resulting data of the NIOSH Method 7082 analysis will be made available to the Client Representative in the form of laboratory reports during the process of the remedial activities for evaluation of dust control measures.

6.3 Hydrogen Sulfide

With a 1-day advanced request, real-time resulting data will be available to the OBRA Representative for evaluation of odor control measures. Electronic data will be downloaded and archived from each instrument onto a personal computer. Unformatted data logs will then be available in the field to the OBRA Representative the next day. A formatted data log will made available by Pacific States at the beginning of the following week after the sampling event via electronic transmittal.

7.0 CORRECTIVE ACTIONS

Monitoring data will be compared to the Recommended Action Levels (RALs) described in the Contract Document (EKI, 2005) and are shown on Table 1. The RALs are intended to be protective of visitors outside the Limits of the Work and off-site workers and tenants in the project area. If at any time during soil excavation and loading activities, the RALs are exceeded or odors are detected at the Site Perimeter, OBRA's representative will be notified promptly, soil excavation, stockpiling, spreading, mixing, and loading activities will be temporarily halted and evaluated, and additional odor control measures will be implemented by Pacific States in accordance with the *Dust and Odor Control Plan* (Northgate, 2005b) to the satisfaction of OBRA's representative before resuming work.

8.0 REFERENCES

City of Oakland, 2002, *Final Environmental Impact Report for the Oakland Army Base Redevelopment Plan.*

Erler and Kalinowski, Inc., 2002a; *Final Remedial Action Plan.*

Erler and Kalinowski, Inc., 2002b; *Final Risk Management Plan.*

Erler and Kalinowski, Inc., 2004, *Draft Remedial Design & Implementation Plan for the Former ORP/Building 1 Area, Former Oakland Army Base—EDC Area.*

Erler and Kalinowski, Inc., 2005, *Contract Documents for Former ORP/Building 1 Area Remediation Project—EDC Area, Oakland, California.*

GAIA Consulting, Inc., 2002–2003, *Annual Progress Report, West Oakland Particulate Monitoring Program.*

Northgate Environmental Management, Inc., 2005a, *Site-Specific Health and Safety Plan.*

Northgate Environmental Management, Inc., 2005b, *Dust and Odor Control Plan.*

TABLES

TABLE 1
Information on the Monitoring Task, Recommended Action Level and Anticipated Monitoring Equipment
Former ORP/Building 1 Area
Former Oakland Army Base—EDC Area
Oakland, California

Monitoring Task	Recommended Action Level	Equipment	Description	Analytical Method	Calibration Procedure	Flow Rate	Filter Media	Reporting Range/Limits	Duration
Particular matter, airborne dust	1,000 µg/m^3	mini-RAM PDR1000™	Dust aerosol monitor manufactured by MIE	Direct reading	Use zeroing bag	1–2 liters/min	NA	0.001 to 400 mg/m^3 of total dust	Approximately 12-hours, 15 min. averaging period[1, 4]
Hydrogen sulfide	30 ppbv (15-min average)	Gerome 631™	Hydrogen sulfide analyzer	Direct reading	Manufacturer calibrated	0.15 liters/min	NA	3 ppbv to 50 ppmv	15-minutes[1]
Airborne lead	1.9 µg/m^3 (24-hour average)	AirLite™ Sample Pump, nozzle for 10 µm	high-volume air sampling pump	NIOSH 7082	Flow rate verification with Gilibrator-2 pump	2 liter/min	0.8-µm, tare weighted, 37-mm diameter mixed-cellulose ester membrane (MCE)[2]	100 µg per filter of 0.1-10 µm diameter particles	Approximately 12-hours, 200-L air sample[3]
Airborne dust	1,000 µg/m^3	AirLite™ Sample Pump	High-volume air sampling pump	NIOSH 500	Flow rate verification with Gilibrator-2 pump	1 liter/min	5-µm, tare weighted, 37-mm Silical PH-PVC filter[2]	6 µg per filter	Approximately 12-hours, working range is 1–20 mg/m^3 for a 100-L air sample[5]

Notes:
1. Shift up to 12 hours each day.
2. Filter analysis by EMS Laboratories, Inc., of Pasadena, California.
3. Daily sampling during first week of active excavation and weekly sampling after first week during active soil excavation.
4. Daily sampling during all potential dust-generation activities.
5. Once a week during all potential dust-generation activities.

TABLE 2
Monitoring Schedule
Former ORP/Building 1 Area
Former Oakland Army Base—EDC Area
Oakland, California

Monitoring Parameter	Excavation	Treatment	Stockpiling	Loading
Total Pb (as PM10)	First 5 days [1]	First 5 days [1]	na	na
Total Dust	Daily	Daily	Daily	Daily
H_2S	Daily [2]	Daily [2]	Daily [2]	Daily [2]

Notes:
1. The frequency may be reduced after the first week with approval by OBRA. Monitoring will be continued for additional 3 days if the Recommended Action Level (RAL) is exceeded. RALs are presented in Table 1
2. Monitoring will be performed during activities that generate hydrogen sulfide odor.

na = not applicable

FIGURES

Basemap from Thomas Guide, California, 2004

APPROXIMATE LOCATION
NOT TO SCALE

FIGURE 1
Site Location Map

Former ORP/Building 1 Area
Former Oakland Army Base
Oakland, California
September 2005
Project No. 1147.01

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environmental management, inc.

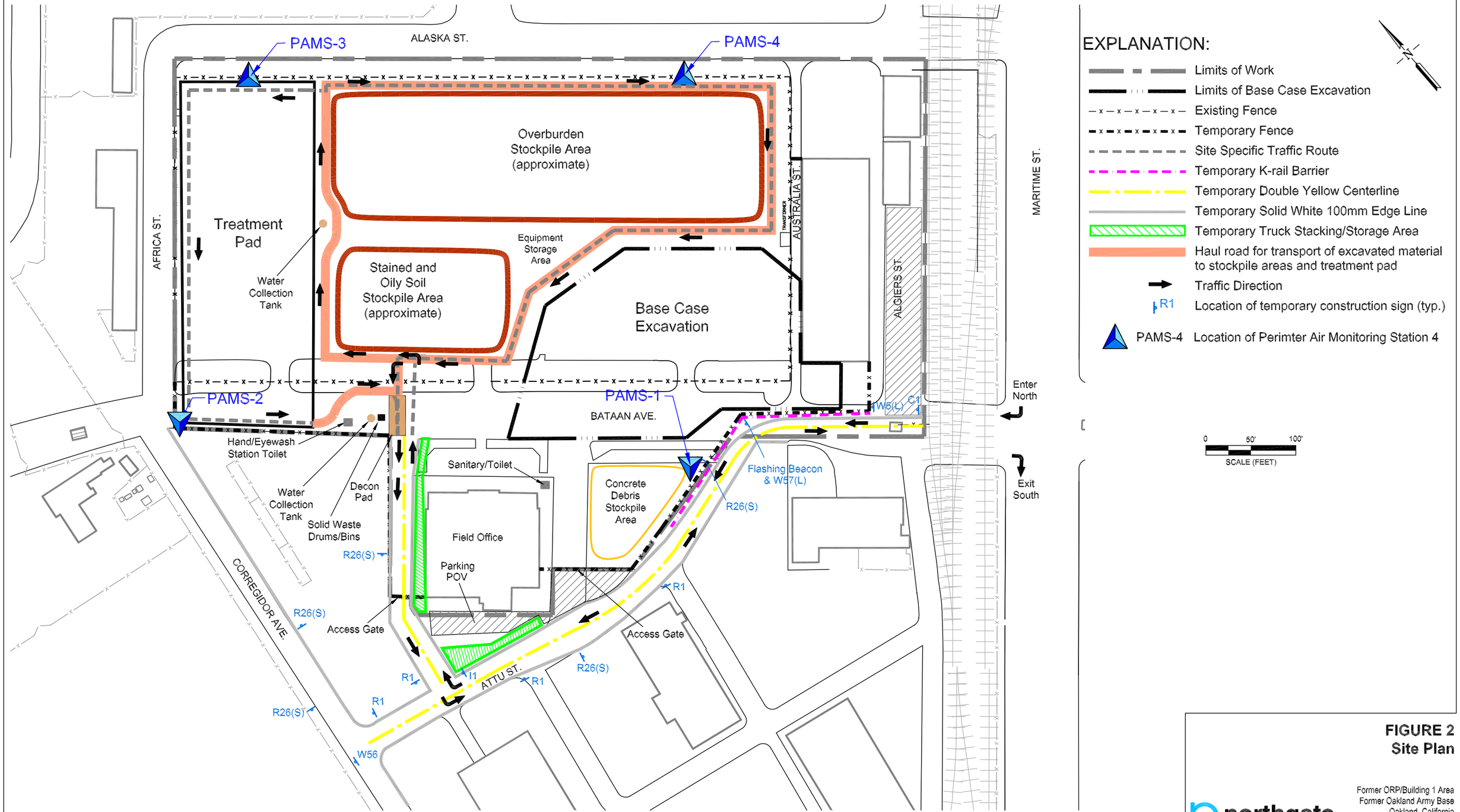

FIGURE 2
Site Plan

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Former ORP/Building 1 Area
Former Oakland Army Base
Oakland, California
September 2005
Project No. 1147.01

northgate
environmental management, inc.

September 15, 2005 *Project No. 1147.01*

Mr. Andrew Clough
Environmental Manager
Oakland Base Reuse Authority
700 Murmansk Street, Suite 3
Oakland, California 94607

Re: Response to DTSC's September 2, 2005 Letter
Perimeter Air Monitoring Plan
Former Oil Reclaiming Plant (ORP)/Building 1 Area
Former Oakland Army Base—Economic Development Conveyance Area
Oakland, California

Dear Mr. Clough:

On behalf of the Oakland Base Reuse Authority (OBRA), Northgate Environmental Management, Inc., (Northgate) has prepared these comments in response to the above referenced correspondence from Henry Wong, Remedial Project Manager, Office of Military Facilities, Department of Toxic Substances Control (DTSC), dated September 2, 2005.

1. Section 2.0: Please define "potential dust-generating workday." Most days during the remediation period would involve dust-generating activities.

Response to Comment No. 1.

The section has been modified to define potential dust-generating activities.

2. Section 2.0, fourth paragraph, second sentence: Please remove the lone quotation mark. Please replace "NNW wind" with "NNE wind."

Response to Comment No. 2.

The sentence has been modified as requested.

1. ***Section 3.0: Please indicate the distance between the air monitoring equipment's sampling inlet and the ground surface.***

Response to Comment No. 3.

The section has been modified to indicated the distance between the air monitoring equipment's sampling inlet and the ground surface.

4. Section 3.0: Please define "potential dust-generating activities." Nearly all works at the Building 1 Area would generate dust.

Response to Comment No. 4.

The section has been modified to refer to the operation of heavy equipment, rather than dust generating activities.

5. Section 4.2: The PAMP indicates that daily air sampling will be conducted during each work shift of the first week of active excavation. DTSC believes all excavation is active excavation and air monitoring should be conducted. Please specify the duration of each work shift, the number of work shifts in a day, the beginning and ending time in a day, and the number of workdays in a week.

Response to Comment No. 5.

The section has been modified to specify the daily work shift beginning and ending time, and the number of workdays in a week.

6. Section 4.0: Please prepare a table clearly showing the monitoring schedule, frequency, and duration for all remediation activities (e.g., demolition, excavation, soil treatment, stockpiling, truck loading, etc.).

Response to Comment No. 6.

A new table has been created that shows the perimeter air monitoring schedule, frequency, and duration for all remediation activities.

7. Section 4.3, first paragraph, first sentence: Please clarify the sentence to indicate that hydrogen sulfide levels will be monitored upwind and downwind of the work area that generates hydrogen sulfide odors.

Response to Comment No. 7.

The sentence was modified as requested.

8. Section 7.0: Please include the Recommended Action Levels in the PAMP, instead of citing a reference.

Response to Comment No. 8.

A reference to Table 1 that shows the Recommended Action Levels has been created in the text.

If you should have any questions regarding the above-referenced response to comments on the *Traffic Control and Transportation Plan, Former Oil Reclaiming Plant(ORP)/*

Building 1 Area, Former Oakland Army Base—Economic Development Conveyance Area, Oakland, California, please contact me at (510) 839-0688.

Sincerely,
Northgate Environmental Management, Inc.

Alan Leavitt, P.E.
Principal

Distribution:

Henry Wong
Remedial Project Manager
Office of Military Facilities
Department of Toxic Substances Control
California Environmental Protection Agency
700 Heinz Avenue
Berkeley, California 94710

Mr. Michael T. Steiger
Project Manager
Erler & Kalinowski, Incorporated
1870 Ogden Drive
Burlingame, California 94010

Ms. Diane Heinze
Associate Environmental Scientist
Port of Oakland
P.O. Box 2064
Oakland, California 94604-2064

Mr. Jim Carolan
Senior Geologist
Geomatrix Consultants, Inc.
2101 Webster Street, 12th Floor
Oakland, California 94612

Ms. Xuan-Mai Tran
Remedial Project Manager
U.S. Environmental Protection Agency - Region IX
Federal Facilities Cleanup Branch
75 Hawthorne Street, (SFD-8-2)
San Francisco, California 94105

Ms. Adriana Constantinescu
Project Manager
California Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Mr. Roger Caswell
BRAC Environmental Coordinator
DA BRACO AFO (OARB BEC)
BRAC Transition Office
700 Murmansk Street, Suite 3
Oakland, California 94607